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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KIM, EUNHEE

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/799,344	Applicant(s) MARSHALL, MICHAEL CRAIG	
	Examiner Eunhee Kim	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-23, 25 and 28-31 is/are pending in the application.
- 4a) Of the above claim(s) 8-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23, 25 and 28-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/28/2008 has been entered.

2. The amendment filed 04/28/2008 has been received and considered.
Claims 8-22 are withdrawn and Claims 23, 25, and 28-31 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 28 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "an appropriate interaction" in lined 24 is a relative term which renders the claim indefinite. The term "appropriate" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 23, 25, and 28-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hultgren et al. (US Patent No. US 6217334 B1), in view of Kim (US Pub No. 2002/0031743), and further in view of Hultgren et al. (US Pub No. US 2004/0017369).

As per Claim 23, Hultgren et al. (US Patent No. US 6217334 B1) teaches a system for generating an electronic model of a dental impression- study cast (Fig. 5), the electronic model having a common coordinate system, the system comprising:

a base plate module configured to couple to a scanning device (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27);

a first scanning apparatus for positioning physical objects module configured to couple to the base plate module, the first scanning module being configured to position a first study cast of a first dental arch within a scanning device to generate a first electronic model of the first dental arch (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27), a second scanning module configured to position a second study cast of a second dental arch within the

scanning device to generate a second electronic model of the second dental arch, the second scanning module including a second plurality of alignment spheres (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27).

Hultgren et al. (US Patent No. US 6217334 B1) fails to teach explicitly the first scanning module including a plurality of alignment spheres;

the second scanning module being configured to couple selectively to the base plate module and to the first scanning module;

an articulator configured to couple to the first and second scanning modules, the articulator being configured to position the first scanning module relative to the second scanning module to orient an occlusal surface of the first study cast towards an occlusal surface of the second study cast; and

a data processing system for generating the electronic models corresponding to each of dental arches, the data processing system configured to generate the electronic models as polygonal mesh representations of the dental arches, the electronic models being generated within a common coordinate system.

Kim teaches the first scanning module including a plurality of alignment spheres ([0057]-[0060], Fig. 1-2, 7-8 and the description);

the second scanning module being configured to couple selectively to the base plate module and to the first scanning module ([0057]-[0060], Fig. 1-2, 7-8 and the description);

an articulator configured to couple to the first and second scanning modules, the articulator being configured to position the first scanning module relative to the second scanning

module to orient an occlusal surface of the first study cast towards an occlusal surface of the second study cast ([0057]-[0060], Fig. 1-2, 7-8 and the description).

Hultgren et al. (US Pub No. US 2004/0017369) teaches a data processing system for generating the electronic models corresponding to each of dental arches, the data processing system configured to generate the electronic models as polygonal mesh representations of the dental arches, the electronic models being generated within a common coordinate system ([0035]-[0041]).

Hultgren et al. (US Patent No. US 6217334 B1), Kim, and Hultgren et al. (US Pub No. US 2004/0017369) are analogous art because they are all related to a dental impression system.

Therefore, it would have been obvious to one of ordinary skill in the art of at the time the invention was made to have included the apparatus of Kim and the polygonal mesh representations of Hultgren et al. (US Pub No. US 2004/0017369), with the method of generating electronic model of a dental impression of Hultgren et al. (US Patent No. US 6217334 B1) because Hultgren et al. (US Pub No. US 2004/0017369) teaches advantages of system that generates an electronic model of a dental impression, and the system captures image representations of physical objects accurately in a form that is inexpensive to operate (Paragraph [0006]). Further Kim teaches an advantageous system that provides the most economical fashion ([0012]).

As per Claim 25, Hultgren et al. (US Patent No. US 6217334 B1) teaches wherein the scanning base plate module comprises an x-axis alignment channel and y-axis alignment channel (Fig. 4 and the description); and

the alignment spheres are coupled to the x-axis alignment channel and the y-axis alignment channel to position the second scanning plate module at a known location relative to the scanning base plate module (Fig. 4 and the description).

Hultgren et al. (US Patent No. US 6217334 B1) fails to teach explicitly the physical model plate modules comprise the plurality of spheres.

Kim teaches the physical model plate modules comprise the plurality of spheres ([0057]-[0060], Fig. 1-2, 7-8 and the description).

As per Claim 28, Hultgren et al. (US Patent No. US 6217334 B1) a method for generating an electronic model of teeth of a patient (Abstract), the method comprising:

mounting a first physical model models onto a first scanning plate module, the first physical model representing teeth of a lower jaw of a patient, the first scanning plate module positioning the first physical model within a coordinate system of a scanning device, and the first scanning plate module coupling the first physical model to a scanning base plate module of the scanning device (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27);

scanning the first physical model to obtain position data of the teeth of the lower jaw of the patient and position data of the alignment spheres (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27);

generating a first electronic model representing the teeth of the lower jaw of the patient (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27),

mounting a second physical model onto a second scanning plate module, the second physical model representing teeth of an upper jaw of the patient, the second scanning plate module positioning the second physical model within a coordinate system of a scanning device, the second scanning plate module and the second scanning plate module coupling the second physical model to a scanning base plate module of the scanning device (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27);

scanning the second physical model to obtain position data of the teeth of the upper jaw of the patient and position data (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27);

generating a second electronic model representing the teeth of the upper jaw of the patient (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27).

Hultgren et al. (US Patent No. US 6217334 B1) fails to teach explicitly the first scanning plate module including a plurality of alignment spheres, and the second scanning plate module including a plurality of alignment spheres,

the first electronic model including a polygonal mesh representation of the scanned position data;

the second electronic model including a polygonal mesh representation of the scanned position data;

after generating the first and second electronic models, positioning each of the scanning plate modules to arrange the physical models relative to each other based on an appropriate interaction between the teeth of the lower jaw and the teeth of the upper jaw to form a composite scanning apparatus;

scanning one of the alignment spheres within the combined scanning apparatus; and
transforming the scanned positional data of the first and second electronic models to
generate a composite electronic model in a common coordinate system, the composite electronic
model representing the teeth of the upper jaw and the teeth of the lower jaw of the patient.

Kim teaches the first scanning plate module including a plurality of alignment spheres,
and the second scanning plate module including a plurality of alignment spheres, and the
combined scanning apparatus ([0057]-[0060], Fig. 1-2, 7-8 and the description).

Hultgren et al. (US Pub No. US 2004/0017369) teaches the first electronic model
including a polygonal mesh representation ([0035]-[0041]);

the second electronic model including a polygonal mesh representation ([0035]-[0041]);
after generating the first and second electronic models, positioning each of the scanning
plate modules to arrange the physical models relative to each other based on an appropriate
interaction between the teeth of the lower jaw and the teeth of the upper jaw to form a composite
scanning apparatus ([0035]-[0041]);

scanning one of the alignment spheres ([0035]-[0041]); and
transforming the scanned positional data of the first and second electronic models to
generate a composite electronic model in a common coordinate system, the composite electronic
model representing the teeth of the upper jaw and the teeth of the lower jaw of the
patient([0035]-[0041]).

As per Claim 29, Hultgren et al. (US Patent No. US 6217334 B1) fails to teach explicitly
generating a position transformation vector using positional data obtained by scanning the

alignment sphere, the position transformation vector being used to transform the first and second electronic models into a common coordinate system.

Hultgren et al. (US Pub No. US 2004/0017369) teaches generating a position transformation vector using positional data obtained by scanning the alignment sphere, the position transformation vector being used to transform the first and second electronic models into a common coordinate system (Fig. 3a-7, [0035]-[0041]).

As per Claim 30, Hultgren et al. (US Patent No. US 6217334 B1) teaches wherein positioning each of the scanning plate modules comprises positioning the scanning plate modules to arrange the physical models into a first bite position (Fig. 2A-5, the description, Col. 5 lines 46-67, Col. 6 lines 1-67, Col. 7 lines 1-27).

As per Claim 31, Hultgren et al. (US Patent No. US 6217334 B1) fails to teach explicitly wherein positioning each of the scanning plate modules comprises positioning the scanning plate modules into an occlusion centric relation position.

Kim teaches wherein positioning each of the scanning plate modules comprises positioning the scanning plate modules into an occlusion centric relation position ([0057]-[0060], Fig. 1-2, 7-8 and the description).

Response to Arguments

5. Applicant's arguments filed 04/28/2008 have been fully considered but they are not persuasive.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eunhee Kim whose telephone number is 571-272-2164. The examiner can normally be reached on 8:30am-5:00pm Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Eunhee Kim/
Examiner, Art Unit 2123

/Paul L Rodriguez/
Supervisory Patent Examiner, Art Unit 2123